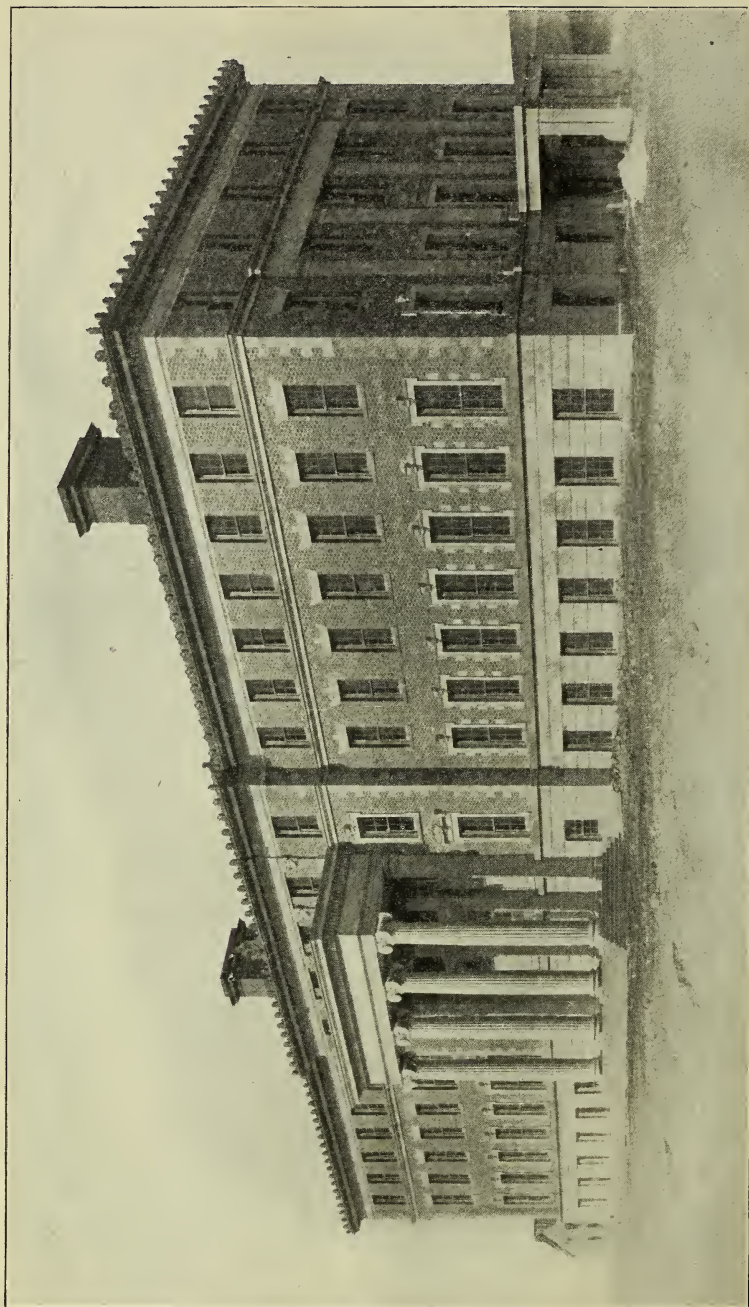


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New Agricultural Building, University of Wisconsin.

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CONTENTS

Editorial Chat	23
The College and the Farmer	25
F. A. Derthick	27
The University Extension Movement.....	27
The International Live Stock Exposition	28
Commercial Pepsin in Cheddar Cheese Making	29
Renick W. Dunlap.....	31
Extend the Influence of the Agricultural College	32
Elementary School Agriculture	33
The New Agricultural Building at Wisconsin University	34
Railroads Take Up Forestry.....	34
Farmers and Artists	36
Dairy Notes	38
Chemistry of Soils as Related to the Yield of Crops	38
College and Alumni News.....	39
General Agricultural News.....	40

EDITORIAL CHAT.

The increase in the enrollment of the College of Agriculture for the present term is very gratifying. The actual number enrolled is 207, an increase of 20 over the same time last year. The number of new students is 101, the number in the long course for the four classes is 123, of which number 44 are freshmen, 45 sophomores, 48 juniors, and 16 seniors. There are seven special students and two post-graduates. The total number in the short courses is 75. The total enrollment for the last twelve years has been as follows:

1891-2.....	40
1892-3.....	47
1893-4.....	71
1894-5.....	90
1895-6.....	83
1896-7.....	97
1897-8.....	144
1898-9.....	164
1899-0.....	157
1900-1.....	210
1901-2.....	198
1902-3.....	243

The present enrollment of 207 for the first term is a substantial gain, since the figures above include the winter course



dairy students and are not comparable with this figure.

It will be readily seen that the growth of the College has been rapid and steady, although not to say phenomenal. In no year, however, has the number been larger and never have the prospects been brighter than at this time, providing that sufficient means is provided for the working out of contemplated improvements and for the development which this increase in students is demanding. The present year nevertheless promises to be a very successful one. The College is rapidly recovering from the recent disturbance due to the change of deans and is fast getting into its old-time working order.

The needs of the College of Agriculture were never greater, and the necessity for united action never more apparent than at the present time. It is universally conceded that if the College is to maintain its place among such educational institutions, something must be done in securing larger financial support for work. The development of the College thus far has been steady, its foundations have been well laid, its influence is deep-rooted, but with the present support the limit of successful development has been reached. We have reached a stage where we must either make a decided move forward or we shall begin to move backward; and the most hopeful sign respecting this condition is the full realization of the fact by those in authority at the institution. Consequently within the last two months there has been no small amount of agitation regarding this matter, and every feasible plan is being considered to make possible this development which it is conceded must come.

A conference of prominent agriculturists of the state was recently called and the men spent the first half of the

day looking over the ground and estimating the needs of the College, and the last half in consultation with the President and members of the agricultural faculty discussing ways and means for securing this much-needed development. A committee was appointed to present the matter before the various state agricultural organizations, and an attempt is to be made to secure the united support of the agriculturists of the state in securing legislative support.

The agricultural faculty has also under consideration various plans whereby this support may be secured, and it is evident that no stone will be left unturned in this attempt to supply the pressing needs of the College.

THE STUDENT most heartily commends any action which has for its object the upbuilding of the College, and we appeal to every loyal alumnus and ex-student to aid in every possible way such laudable ambitions. The large number of old students scattered over the state would be a power if they should unite in concerted action. We see no reason why it should not be done.

Statistics have just been completed regarding the graduates of the College of Agriculture since 1892. Since that time there have been 67 graduates, 18 of whom are engaged in work in agricultural colleges and experiment stations; 14 are employed by the United States Department of Agriculture; 30 are engaged as practical farmers and gardeners, and five are engaged in other callings. These statistics show the high character of the work done at the college from the fact that such a large per cent. of these men are engaged in scientific investigations and teaching. There are probably few institutions of a like nature which can show such a large per cent. of men engaged in such work. We often hear it said that the college does not educate

for the farm, and in so far as the long course is concerned, there is more or less truth in the statement, but it must be remembered that a man engaged in teaching agriculture or in scientific investigational work is of more value to the advancement of the cause of agriculture than if he were following practical work. Taking the college as a whole, however, we find that much the larger per cent. of the men who attend return to the farm. It has been the idea of the promoters of this college that its special field lay in developing a strong four-year course. That it has succeeded is evidenced by the statistics above given. For while the farms are supplied by the men from the short course and those that do not finish the long course, yet the long course men are the ones that are winning to the college the most credit, and in this field we feel that the college is doing an excellent work.

In other words it can be said that it has been the idea of Professor Hunt, who is responsible for the present development of the college, that the particular field to which we should give our attention in Ohio is that of developing an agricultural college and not an agricultural school. Consequently the course has been strengthened and the requirements for admission raised until today pedagogically speaking there are few agricultural colleges whose graduates are better trained. However, there is still room for much improvement and if we are to maintain our position we must at once make every effort to increase our facilities for instruction that we may keep pace with the wonderful development that is taking place in some of the other colleges.

The College and the Farmer.

The farmer has not always accepted the idea of agricultural education with grace. Economical methods were not necessary to a certain sort of success a few years ago. Industry was without system, specialization was unknown. But all this has greatly changed during the last decade and the change will be complete in less than another decade. Professor L. H. Bailey says on this point:

"Nothing is more evident in the new place that agriculture is taking in our civilization than the fact that the colleges and experiment stations are rapidly becoming its leaders; a remarkable company of competent men is adding knowledge, resourcefulness, and dignity to it. The teacher of agriculture is no longer a book farmer. The old academic way of teaching agriculture is passing forever."

Some one once asked Reynolds, the celebrated artist, how to mix paints to produce his beautiful colors. He answered: "Mix them with brains." And that is the way to make farming a success. The most remarkable forward movement today in the educational world is the one which has for its aim and end the training of men and women for the American farm. Agriculture is now recognized as a science, and the art of it has been transformed and uplifted through invention, until the drudgery commonly associated with farm life has been forced out of it.

The importance of this forward movement will not be overestimated, when we consider that fully one-half of our population is directly related to agriculture in some of its branches, while the entire population is dependent upon its success in producing the world's provender.

Then to make two blades of grass grow where but one grew before is one of the primary lessons of the new cult. To make the man who tills the soil familiar with its nature and its possibilities, to teach him to so cultivate as to conserve its fertility and moisture, and to study the nature of plant life, to learn the right kind of crops to grow and to differentiate between poor and good seed, these are a few of the points which the modern farmer recognizes as bearing directly upon the question of successful agriculture.

The live stock man, the orchardist, the dairyman, the creamery man, the poultry raiser, all alike have felt the impulse of this forward movement, and show results of the most satisfactory nature. Yet none more clearly understand that agricultural education is just at the beginning of development in this direction than the progressive farmer and the expert in the schools.

Fifty-five experiment stations in the United States are working out solutions of the great problems of science in agriculture, and fifty-eight colleges, some of them model institutions of learning, are offering to American youth not only fine scholastic opportunities, but technical training in all branches of agricultural work. And this is where a student who spends a few years at an agricultural college has the advantage over his less fortunate brother who does not believe in scientific agriculture. The instructors in our agricultural schools are keen, broad-minded men who have had much practical experience, and are able to direct the mind of the young man fresh from the practical work of the farm along lines that will render to him the greatest possible service in his future work. What can be of more benefit to the young man intending to become a breeder of live stock than a thorough

knowledge of the various breeds of the latest and most approved methods in feeding and marketing his finished products, all of which form a large part of the work pursued in every agricultural college. And we might go further and mention the work in the study of soils or in the dairy laboratory, the work in each becoming more and more elaborate each year as the student body increases and new demands are made upon them.

The time has arrived when more extensive farming must be practiced. With the ever-increasing demand for larger supplies of food products facing the producer, it becomes necessary to increase the production not by increasing the present area, but by farming more intensively the present area. It is an undisputed fact that the average of our staple crops can be increased several times if they were but properly grown and cared for. It is done in European countries, and why not here?

Intensive farming implies more intelligent farming. To farm more intelligently the people must be educated in the underlying principles and sciences of their chosen work, and that is what the agricultural college of today stands for. In a recent address, Secretary of Agriculture Wilson, speaking of the education of farmers, said: "As agriculture is the foundation of our national prosperity, we should strive to promote the most intelligent conditions on the farms, so that our material prosperity may be large and perpetual."

Thus it is not merely for the personal good to be derived from a college course that we urge college training for the farmer, but for the uplifting and up-building of the profession at large.

The development of agriculture will mean greater prosperity not only for the farmer, but for all, and with an edu-

cated farming class we shall have the most solid foundation for a successful future for our republic. F. R.

F. A. Derthick.

The recent appointment of F. A. Derthick, of Mantua, as a member of the Board of Control of the Experiment Station to fill the vacancy left by the death of Friend Whittlesey, has been received with general approval. Mr. Derthick is very well known throughout the state as a progressive farmer and as a very able man. He is Master of the State Grange, an ex-member of the State Board of Agriculture, and ex-Dairy and Food Commissioner. It is generally conceded that the Governor's choice was a very wise one and that the station will find in Mr. Derthick a careful, considerate man of good judgment and high ideals who will aid much in making the station more efficient and in developing the work in the proper way.

The University Extension Movement.

There has been a growing sentiment among those connected with the College of Agriculture that some form of college extension work must sooner or later be installed in connection with the regular work of the College, although the time and method of its installation have been but vaguely realized. The officers of the Agricultural Student Union, however, have been somewhat more progressive and during the past year have succeeded in accomplishing something towards developing this work. At the meeting of the Union last January the subject was presented and an effort was made to decide on some plan for the development of the work. After careful consideration, it was decided that

if the necessary funds could be procured, a division of the Union should be established having to do with this line of work, and a committee was appointed to report on plans at the meeting of the Executive Committee in September. This committee outlined a plan of work which it considered applicable and asked the University for a small appropriation to enable the work to be started. Owing to financial embarrassment the University authorities refused this grant and the matter was necessarily dropped.

In the meantime, A. B. Graham, Superintendent of the Springfield Township Schools in Clarke County, had written Professor Hunt asking what could be done toward establishing a Boys' and Girls' Experimental Club among the pupils of his schools. As the College had no official right to conduct such work, the matter was referred to L. H. Goddard, Director of the Agricultural Division of the Students' Union, who organized the club and furnished material from that department for the experimental work. The plan was eminently successful and a flourishing club has been maintained during the past season. The result has been that the feeling among the Union officers regarding the needs for this line of work has continually increased, and at the meeting of the Executive Committee it was decided to make this a prominent feature of the Union work, if the necessary funds could be secured. It was further decided that such funds could legitimately be appropriated largely by the University, since the work lies really in the field of the College of Agriculture. The matter has therefore been presented to the agricultural faculty and plans are being considered for the establishment of some such work.

It is believed that the time is ripe for the establishment of such a line of work

in Ohio, and further that those in authority in the Agricultural College and the Students' Union will not be fulfilling their whole mission as agricultural educators if the work is longer neglected. The plan strikes directly to the foundation of our educational system—to the rural schools, to which we must look for our future constituency as a college and as an agricultural state. Its action will be deepseated and thoroughly effective where it applies to the schools, and it will be broadening and uplifting where it applies to the farmers directly.

Again, all other states with which we care to be compared, are either already engaged in some such work as this or are making plans for its establishment. The extensive work in New York is too well known to need comment other than to say that last year the Extension Bureau had 35,000 persons on its mailing list. Illinois has established a department of university extension, with a salaried man at its head who devotes his entire time to the work. Minnesota has for years maintained what is virtually an agricultural high school in connection with its agricultural college, besides doing an immense amount of work in the public schools. Wisconsin has begun the establishment of county agricultural schools, and there is a state law requiring all teachers above the third grade to pass an examination in elementary agriculture. Iowa is seeking some feasible plan for establishing this work, with the assurance of ample funds for its furtherance. Missouri is introducing agriculture into the common schools and requiring teachers to pass an examination in this subject. Its state normal schools each have a professor of agriculture for the purpose of training teachers. Pennsylvania has for years maintained a successful correspondence course among the farmers of the state. North Carolina requires that agriculture

be taught in the rural schools. Michigan is conducting a line of work similar to that of Pennsylvania, while California, West Virginia and Connecticut are also doing work of this nature.

It is full time that Ohio was taking active steps toward the carrying forward of this line of work. Our hope is in our rural schools and they should not longer be neglected. Give to the youth of the state that training which shall make them appreciative of nature, which shall give them rational ideas of agriculture and a respect for rural pursuits, spread the teachings of the Agricultural College among the farmers in a generally helpful, uplifting way, and we shall set in play a series of forces that shall be powerful factors in bringing about that development of agriculture and that amelioration of rural conditions which will mean so much to the future welfare of the state.

The International Live Stock Exposition.

The International Live Stock Exposition at Chicago for 1903 promises to be greater than ever before. Its value as an educational factor is becoming more and more appreciated from year to year and its influence upon the live stock interests of the United States is of wonderful importance.

The managers have this year provided greatly increased stall room and, although the improvements in buildings are not as yet complete, the facilities for handling all kinds of stock will be very much improved.

The program is arranged to give each and every breed full benefit of all that the show implies to the exhibitor. There is no material change in the rules or regulations regarding the exhibits, and the awards are open to the same com-

petitors as heretofore. The entries and inquiries received indicate a greater interest and a larger exhibit than ever before and all plans are complete for a most successful gathering.

**Commercial Pepsin in Cheddar
Cheese Making.**

Although the manufacture of cheese in some form or other has been carried on from almost prehistoric times, science has done comparatively little to explain the process of cheese ripening. The method of making cheese as followed today is what may be called a "rule of the thumb" method and has been developed empirically by the practical man at the vat, a man without any scientific knowledge of the material with which he was working. It is only in somewhat recent years that any considerable amount of scientific research has been devoted to the subject of milk or its products. As a result of these investigations a number of marked improvements have been made, especially in the methods of making cheddar cheese. In spite of all this research, however, our understanding of the process of cheese ripening is still very meager. Everyone is acquainted with the fact that during the period of ripening the product changes from a rubbery, tasteless curd to a plastic, pleasant tasting substance that we call cheese but what causes this change is still a disputed problem. That the amount of practical knowledge derived from the scientific investigations is so small compared with the large amount of work done does not seem strange to one acquainted with the very complex composition of the materials used in cheese making. One of the chief drawbacks to an understanding of the process is the very limited knowledge we have at

present of the composition of the rennet extracts used to coagulate the milk. For some years it seems to have been generally conceded that good rennet can be prepared only from the stomachs of calves, and one frequently meets the statement that rennet extract should be made from "the fourth or digestive stomach of a calf that has not yet ceased to live on milk." These rennet extracts, we are told by the physiologist, contain at least two enzymes, one of which (rennin) coagulates milk but does not digest it, the other (pepsin) digests milk but does not coagulate it.

The writer has never felt convinced of the presence of two distinct enzymes, i. e., rennin and pepsin. As these enzymes are to a large extent hypothetical substances it seems that it would have answered the purpose just as well to have ascribed two properties to one body, as to have assumed the presence of two different ones, especially as the enzymes themselves have never been separated in the pure state. In the hope of throwing a little light on the subject of the probable existence of one or two enzymes in the stomach, a series of experiments have been conducted by the writer which, while they have made no appreciable addition to the scientific phase of the subject, have taken a practical turn which seems to justify their publication.

While connected with the Wisconsin Experiment Station the writer suggested that it be attempted to make Cheddar cheese by using commercial scale pepsin as a substitute for rennet extract. Two such cheese were made and reported briefly in the seventeenth annual report. The milk coagulated to a firm curd that cut and acted in every way like the curd produced by rennet. The cheeses were typical high rennet

cheeses both in appearance and in character of the chemical by-products. That they resembled high rennet cheese is not surprising in view of the fact that eight times as much pepsin was used as later experiments show to be necessary. In the earlier stages of ripening they were in every way desirable cheeses, but later developed the bitter flavor characteristic of high rennet cheese ripened at high temperatures. When about two months old two experts scored the pepsin cheese above the control cheese, not knowing the history of the cheese they were examining.

Although this experiment suggested interesting possibilities the press of other work made it impossible to follow this matter up at that time. During the past winter, however, through the courtesy of Professor Decker of the Dairy Department of the Ohio State University, it was made possible to continue the work. The first thing done was to prepare a solution of pepsin having the same coagulating power as the sample of Hansen's Rennet Extract, then being used in the cheese room. After several trials it was found that a 5% solution of pepsin was practically of the strength desired. A number of duplicate cheese were made on different days from previously well mixed milks, using the pepsin solution in one vat and Hansen's Rennet Extract in the other. Apparently the curds produced were just alike. Mr. B. B. Herrick, instructor in cheese making, and well known as a practical cheese maker of long experience, conducted the experiments and much of the credit for their successful outcome is due to him. He is very positive that no cheesemaker could have detected any difference in the curds of the two vats.

These experiment gave such conclusive evidence that a solution of commer-

cial pepsin could be substituted for rennet extract in Cheddar cheese making that it was decided to continue the study under factory conditions and Mr. Herrick offered to carry on the work at his own factory at Wellington, Ohio. Early in the season, two day's run of milk, several days apart, was made up into flats and held in his curing room at about 60° F. In making this cheese a 5% solution of pepsin was used, being added to the milk in the proportion in which rennet extracts is usually used, i. e. about three fluid ounces to the thousand pounds of milk. The curds were perfectly normal and the finished cheese of excellent quality. As the local market calls for a very young cheese, about twenty of this lot were sold when six weeks old to Mr. Herrick's regular trade and caused no comment which indicated that there was no suspicion that they were abnormal in any respect. When asked about them one dealer said that they were unusually fine cheese.

Since making the trials reported above, several runs of milk for a period of a week each have been made into pepsin cheese and the cheese are without exception of good quality and in every way equal to those made with rennet extract. To cap the climax, Mr. Herrick took the first prize at the State Fair with pepsin cheese made in June, the cheese scoring 98%. The judge deducted the two points because the flavor was low, a fact not surprising as this cheese was held in cold storage the greater part of its life.

The writer feels that it has been established beyond peradventure that commercial scale pepsin is an available source of coagulating material for cheese making. The question that will suggest itself to the practical man is; Does pepsin offer any advantage over rennet extract? There is practically no

difference in the cost of the two at the present time but there are one or two points in favor of pepsin.

Rennet extracts are variable in strength. One well-known cheese maker told the writer that it always took him some time to become accustomed to each new lot of rennet. The scale pepsins put on the market by reliable manufacturers to meet the requirements of the U. S. Pharmacopoeia (the so-called 1 to 3,000 pepsin) have proved fairly constant in strength. Again, rennet extracts deteriorate rapidly, especially in warm weather, while pepsin being in a dry form can be kept for a long time without injury. Rennet extracts often contain large numbers of bacteria and molds while pepsin can be obtained approximately sterile. On the whole this use of pepsin seems to be of sufficient promise to justify a somewhat extended trial.

ALFRED VIVIAN.

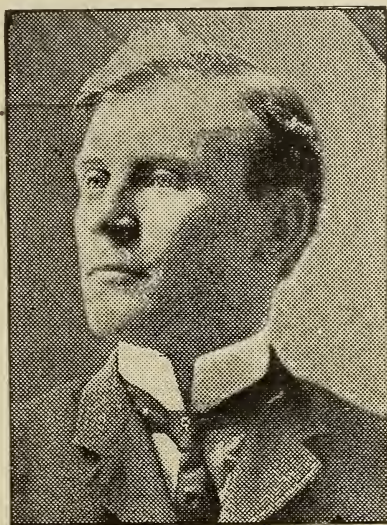
RENICK W. DUNLAP

Candidate for State Senator from this District.

It is with no small amount of pleasure and pride that THE STUDENT calls the attention of its readers to Mr. Dunlap, who is making the run for State Senator from this district. No man with a cleaner record, a better ability and who is more deserving of the support of the people of the entire district could be chosen for this important and honorable office.

Mr. Dunlap was born and raised on the farm, entered the Agricultural College of the Ohio State University in the fall of 1891, and was graduated with the class of 1895. After graduating he assumed the management of a large farm near Kingston, Ohio, which he has since managed most successfully. While in

college Mr. Dunlap was known as a thorough and conscientious student, but at the same time as a typical University man whose interests were wider than his books or his college work, extending to every University and college enterprise. Likewise on the farm he has found time to be a public-spirited citizen, and while serving the entire community in various



RENICK W. DUNLAP.

capacities, the interests of his fellow farmers have always been uppermost in his mind. He is a member of the Patrons of Husbandry and Master of the Local Grange, having been elected as delegate from the latter to the state meeting which is to be held next December.

There are additional reasons why Mr. Dunlap should receive the support of every student, ex-student, alumni, and friend of the University irrespective of party lines. The announced opposition of the small colleges of the state makes it imperative that the University have a number of men in both houses friendly to its interests.

The University has grown so rapidly in the last few years that it has become

necessary that the appropriations be increased or the work be seriously curtailed in a number of departments. The farmers of the state especially cannot afford to see the only institution of learning in the state devoted to their interests seriously crippled by the opposition of a few jealous sectarian schools. The district is a close one. Your vote may elect Dunlap. His influence may secure the appropriations absolutely necessary to carry on the work of the University.

Every student has a right to vote here if he so desires, and he should make some sacrifice to do so at the coming election. Students of the Agricultural College and of the University show your loyalty. You can elect Dunlap if you will, and his election may turn the tide in the legislative fight for the University's support.

Extend the Influence of the Agricultural College.

The time has come when it can no longer be said "He does not need an education, he is going to stay at home on the farm." The successful agriculturist of today is the one who has put himself into the work with as much energy as he who plays on the football eleven, and feels that his position as superintendent of a farm is as responsible as that of the man who holds sway over a theological seminary.

If the farmer of today would be successful it is necessary that he should be capable of giving attention to the details of the farm. This requires a mind that is alert and able to cope with unthought-of difficulties. The problems that confront him today are not merely the old ones of seed time and harvest. He must now understand the structure and composition of his soil, its adaptation to the various crops; in short, he must be a scientist and a scholar.

Our preceding generation in its wisdom seems to have foreseen the coming of this time, and the passage by Congress of the original Morrill bill for the establishment of land grant colleges prepared the way for the movement which has made it possible for the farmer of today to be, if he chooses, enlightened on the problems of his vocation. Such institutions are doing a great work, but it is often too true that they are failing to touch the average farmer directly; he knows only in a vague sort of way that such institutions exist.

Agricultural colleges are however gradually awaking to the fact that it is possible for only a very small per cent. of the farmer boys to come to them, so they must go to the farmer boys. This they are attempting to do by the introduction of agriculture into the secondary and rural schools, by the formation of boys' and girls' experimental clubs, by correspondence courses, etc., all of which are becoming of great importance in our educational system.

While such measures do not come up to agricultural colleges in efficiency, yet they have some advantages which should not be lightly thought of. Regarding correspondence courses especially the student can choose his own time and place of study; he can have the advantage of individual instruction; it teaches one self-reliance and makes one ready for emergencies when they come; and the work does not interfere with the student's regular vocation, but may be pursued at intervals of leisure.

The courses which have been established are of varying merit. Some have not the principle in them which will give the student the privilege which he most needs, that of close contact with his instructor. Those which send out prescribed lessons with questions and blanks for returns seem to bring the student and instructor more nearly together, for in

these the instructor knows just what his student is doing; while in a course in which a text-book is sent out and the student requested to report when he has finished, he is too apt to read that book, fail to report and drop out of the course, simply because he has not had the inspiration which would come from frequently coming in touch with his instructor.

Undoubtedly the value of such a course will depend largely upon the student himself. If he can carry out successfully the course first described, his labor shall not have been in vain, for he will have attained that for which an agricultural education stands, the ability to work out one's own problems, and to convey to others the results of one's researches.

If the agricultural college is to attain the greatest efficiency, it must give attention to some such measures for spreading its teachings, for widening its influence and for extending agricultural education throughout the state.

J. C. W.

Elementary School Agriculture.

"Agriculture for Beginners" is the title of a book recently published by Ginn & Co., New York, under the authorship of Burkett, Stevens and Hill of the North Carolina College of Agriculture and Mechanic Arts. Professor Burkett is a graduate of the College of Agriculture of the Ohio State University and is very favorably known in Columbus, where he has a host of friends. He is now Professor of Agriculture at the North Carolina College of Agriculture, and Professors Stevens and Hill are his associates, the former being Professor of Biology and the latter Professor of English.

The book is intended as a text for the schools of North Carolina, where it

has been introduced as a required text-book for the study of elementary agriculture, which fact alone is ample proof of its value. It is a most pleasingly arranged volume, with a wealth of good illustrations and with the subject matter carefully and intelligently selected. Naturally in a work of this nature the problem of simplifying and condensing the immense amount of material is exceedingly difficult and is a matter that allows of much originality as well as of genius in its presentation. The book shows a cleverness at arrangement and a style of expression which is distinct from the publications of a like nature that have already appeared. It gets away from the text-book form, the mere collection of facts; it is a book that a child would enjoy reading, something that would awaken an interest and set him thinking. It would seem that the authors have come nearer to the ideal presentation than any of their predecessors. We do not want a large volume filled with heterogeneous facts; such a book would never appeal to the young. The idea in the introduction of agriculture into the rural schools as we see it, is not to teach the children to be farmers; there is no room in such schools for mere technical instruction. The inspiration, the proper point of view, a proper respect for rural pursuits, just enough facts to give them the fundamentals is what the children need. Then when they see things in the proper relations it is for them to decide whether they are to be farmers or mechanics, lawyers or clergymen. There are just as truly men on the farm that should not be there, as there are men in other vocations that should have been farmers. The main object then in presenting this subject to the child is to give him the proper point of view; and while there are many things of value that may be impressed upon his mind

regarding the technique, the idea of raising his ideals, his conception of the noble pursuit of agriculture is the paramount feature. This we believe the book accomplishes in large part, and we believe that North Carolina has acted wisely in making it a regular school text.

The New Agricultural Building at Wisconsin University.

The new building for the College of Agriculture at Wisconsin University, shown in our frontispiece, is one of the most modern and convenient of any of its class. The structure is 200 feet in length and 64 feet in depth, with a height of three stories over a well-lighted basement. There is also a two-story addition in the rear, not shown in the cut. The building is constructed of buff pressed brick, terra cotta and Indiana buff Bedford limestone. It has a tile roof and is of slow-burning construction. The agricultural library is included within the building, and in addition to lecture rooms, laboratories, offices and storage rooms, there is an auditorium with a seating capacity of seven hundred. The total cost of the building, not including equipment, was over \$150,000.

Railroads Take Up Forestry.

The Bureau of Forestry has continued this year on a far larger scale the experiments in timber seasoning and preservation for the railroads which it began last year under Dr. Hermann von Schrenk. This summer the work will be carried on in many states—East, South and West—and will be broadened in scope and made even more thorough than before. This work will be done for the New York Central, the Erie, the

Baltimore and Ohio, and the Pennsylvania railroads in the east; and for the Illinois Central, the Santa Fe, the St. Louis and San Francisco the Missouri, Kansas and Texas; the Northern Pacific, and the Burlington in the south and west.

The scarcity of valuable timbers is felt by no class of consumers more keenly than by the railroads, which use every year 110,000,000 ties merely to renew those worn out and decayed. The price of timbers has risen in some instances to a figure which makes their use prohibitive; in other cases the supply is so nearly exhausted that the roads have been compelled to look about for new timbers.

The Bureau of Forestry has been called on to assist in solving the difficulty, and has come forward with the very practical and simple suggestion that the railroads, instead of continuing to use expensive high-grade timbers for such a low-grade purpose as that of railroad ties, shall use the cheaper woods. For example, to the complaint of the New York Central that it finds it more and more difficult to secure longleaf-pine ties from Georgia at the price it can afford to pay, the Bureau suggests that the road use the beech, maple, and birch of the Adirondacks. The complaint that the timbers rot very quickly when laid in the ground is answered by the suggestion that they should be seasoned and preserved, just as beech is seasoned and preserved in France. The Great Eastern railroad of France has succeeded in making beech ties last 35 years by impregnating them with tar oils. The unseasoned longleaf-pine ties used by the New York Central last only five years; and the beech if laid green, without seasoning or preserving, would in many cases last no more than three years. The substance of the proposal

which the Bureau has made to the railroads and which the railroads has thought so well of as to adopt, is that experiments be made to determine whether cheaper timbers may be treated with preservatives at a cost so low and be made to last such a long time, that it will pay to substitute them for the more expensive timbers now employed.

The railroads have thought so well of these ideas that they will not only carry on under the Bureau's direction the necessary experiments in seasoning and preserving, but have engaged the Bureau's help in learning where cheap timbers for ties may be obtained. In other words, the railroads have decided that if they can be convinced that it will pay to season and preserve cheap timbers for ties, they will acquire large areas of timber lands on which they will grow their own trees, cut their own ties, and thus be assured of a steady supply. This means that some of the great railroads of the country are in a fair way to practice forestry on a very large scale, and to employ a great many foresters.

The present method of purchasing railroad ties cannot long continue. It is becoming more and more hazardous to rely on what may be obtained on the market, for the reason that the market is becoming more and more unwilling to let its timbers so as railroad ties when as sawed lumber they would bring a higher price. Eastern roads often have to haul their ties as far as 700 miles. It is absolutely necessary that supplies be grown nearer home and that there be a certainty of how much can be obtained. A railroad that needs half a million ties on short notice must have those ties at any price and is often compelled to pay far more than they are worth. The great advantage to the railroad of growing its own ties and practicing forestry would be that it would know to a cer-

tainty just how many ties it could count on every year and how much they would cost.

An expert of the Bureau is now cruising in the Adirondacks to determine how much available hardwood lands there are along the New York Central's tracks. Similar work will be done for the Erie and the Pennsylvania. A party of foresters is on the 60,000-acre tract of the Baltimore and Ohio road near Camden-Gauley, W. Va., to determine how much tie timber there is on the tract and how many trees it will produce every year under conservative management.

Seasoning experiments with railroad ties are being conducted in co-operation with the Santa Fe railroad and the Kirby Lumber Company at Silsbee, Tex., and the ties are being treated with preservatives at Somerville, Tex. The timbers undergoing the experiments are longleaf, loblolly, and shortleaf pines.

All along the lines of the Illinois Central and the St. Louis and San Francisco seasoning experiments are in progress on swamp, red, pin, and cow oak and beech and gum.

The experiments in seasoning the lodgepole pine, carried on last year for the Burlington railroad in Bear Canyon, Montana, and Sheridan, Wyo., have been continued this year. Last year it was found that 39 per cent. of the weight of the ties was lost by open-air drying, which resulted in an enormous saving in freight.

Work of a similar nature to the railroad experiments is being carried on for the American Telegraph and Telephone company, which used last year 150,000 telephone poles and 3,000,000 feet of timber in cross-arms. Seasoning experiments are being conducted on chestnut telephone poles near Harrisburg, Pa., and on cedar poles near Wilmington, N. C.

Important and valuable as this work is to the railroad and telegraph companies, it is far greater importance and value to the country at large. The use of cheaper timbers for railroad ties is in several ways an economic saving; it relieves the high-grade timbers of a part of the heavy demand that is being made upon them opens a market for timbers for which there is now little sale, and affords splendid opportunities for conservative management of timber lands. The work is being prosecuted according to the regular co-operative system of the Bureau, by which the field and traveling expenses of the Bureau's agents are paid by those for whom the work is done.—*Press Bulletin, Bureau of Forestry, U. S. Department of Agriculture.*

Farmers and Artists.

What is an art? John Stuart Mills says: "An art is the employment of the powers of nature for an end." In fact, art includes everything that man, by the assistance of nature and well-matedly, 414,671 pupils. Comparing this known laws, has rendered useful and beautiful. There is no art that has been so long in its development as the "Art of Agriculture."

The Egyptians were the first people to become famous for their skill in agriculture; it was their chief occupation, and the valley of the Nile became the granary of the world. Over twenty million bushels of corn were furnished annually to Rome. This small country could not provide so much grain if some science of agriculture was not understood. The Egyptians were acquainted with the benefits of a rotation of crops, and were skillful in adapting them to the soils and seasons. They also showed much wisdom in the care and management of their live stock. So much en-

thusiasm was manifested in agriculture by these people that their tombs and monuments are covered with paintings depicting the pastoral scenes and also with inscriptions describing the agricultural methods.

In ancient Greece, agriculture was so well understood that valleys were drained and rocky surfaces covered with transported soil; while excellent breeds of domesticated animals were bred in large numbers. Among the early Romans agriculture was highly esteemed and pursued with earnest love and devoted attention. So great was their love for agriculture that the most famous houses of the early Romans were named after favorite crops and vegetables, such as "Pisones, Fabii and Lentuli." Some of the most intelligent men of Rome, like Cicero and Cato, lived in beautiful villas surrounded by well-tilled farms, and it was there that great advancement was made in agriculture. Cato speaks of irrigation, frequent tillage and manuring as means of fertilizing the soils. Every Roman farmer in those days worshiped Ceres, the goddess of agriculture and the fruits of the earth.

Even on the soils of ancient America the art of agriculture has been well developed. In the ancient empire of Peru agriculture seems to have reached a high degree of perfection, for ruins of basins and canals, frequently carried through tunnels, prove their skill and industry in irrigation.

We cannot understand the beauty of this art in the olden times except from what information we can get from paintings and sculpture; but if we could only have climbed the great pyramid, when Cleopatra ruled in Egypt, and looked up the valley Nile, we would have had the same feeling come over us that we realize today when we gaze at a piece of Greek sculpture. The Nile stretches for

hundreds of miles like some green ribbon bounded on either side by waving fields of grain, showing the highest degree of cultivation. Is this not art? Glance at the Roman hills, when Caesar reigned at Rome. What a picture for the brush of an artist. Far away stretch the long lines of vineyards, laden with their clusters of hanging fruit, with branches well pruned, and all well husbanded.

In all countries the farmers are the founders of civilization and prosperity. As agricultural methods develop, just so does the country. Agriculture not only gives riches to a nation, but the only riches she can call her own. It is the exports of a country that makes her rich and a large per cent. of these comes directly from the farm.

We have inherited all our ideas from the Greeks and Romans, but it is only recently that we have begun to realize that it is possible to improve them. It was always thought that we should farm just as our fathers did before us; but in the last score of years there has been an awakening, as in all other arts. The government has found that her lands can produce more and better produce if they are tended by men who have extensive knowledge of nature's soils, plants, and animals, indeed everything connected with the farm. The outcome has been the agricultural college and experiment station. It is at the agricultural college where the farmers' sons of today are gathered to learn from men experienced in agriculture the best methods of pursuing farming advantageously.

Notwithstanding the advancement already made in this profession most people still regard it as useless to improve the methods of agriculture; but in no in-

dustry has the workman so boundless opportunity to incorporate his own thought in material form. The artist with paint and brush spreads on the canvas the ideal Madonna or the perfect sunset. The sculptor with hammer and chisel in hand transforms the block of marble into the Daphne which seems to breathe. All art is the attempt of the mind to subdue matter to itself, for if the painter has not the ideal picture in his mind the paint and brush cannot express it. It is so with the farmer, if he has not his ideal farm and animals in his mind he will never make an advancement in the line of agriculture.

The arts of sculpture and painting are great; but they appeal only to the feelings,—they do not quench thirst, satisfy hunger or relieve distress. Agriculture is the greatest of all arts, because it subserves a useful end. Man claims the earth for his inheritance. The thick forests through which the red man hunted have been transformed into green pastures, the prairie over which the buffalo roamed has been converted into broad fields of cultivation, and even the sandy deserts of the far west now wave with grass and flowers. These, however, are small problems compared with what man is doing to subdue nature to his own uses. The best farm is not always that with the best natural resources; for nature is often very rebellious to man's attempts at subjection. The best farmer is he who is so well acquainted with nature that he can transform the land into his ideal farm. This man must be trained in the sciences relating to agriculture; for it is only by the knowledge of advanced methods that he is able to overcome nature and make his farm what he will.

E. S. POSTON.

DAIRY NOTES.

The enrollment of students of the Agricultural and Veterinary Courses taking Dairying this term is twenty-two. The work is being extended and developed as rapidly as conditions will permit.

A change has been made in the time of milking which is intended to make it more convenient for the students who do this work. Milking now begins at 5 A. M. and 4 P. M., and bottling at 6:30, morning and evening. The milk of the morning milking is then distributed in the evening and the evening's milk in the morning.

Messrs. E. L. Bowser, E. E. Finney, and W. L. Clevenger are doing the work in the bottling room, Mr. Bowser acting as foreman.

Professor Decker was in Medina the 10th of the month consulting with the residents of that section regarding the establishment of a creamery. The plan has carried and a creamery will be installed. It will be on the gathered cream plan and hand separators will be used by the farmers in preparing their product.

This year is the intermediate year between the one and two-term courses for special dairy students. Beginning with this year the course will be lengthened to two terms, and the first term in this work will be given the coming winter. By this extension of the course much more thorough work can be done and the graduates of the school will have most excellent training in all lines of dairy work.

Chemistry of Soils as Related to the Yield of Crops.

The Secretary of Agriculture announces that the Bureau of Soils has just finished an exhaustive investigation of the chemistry of soils as related to the yield of crops. The results indicate that practically all soils have sufficient available plant food for normal crop yields, and that this supply is constantly maintained through natural agencies in the soils dissolving the material of the soil grains. The difference in yield is dependent upon the condition and kind of cultivation and rotation of crops, maintaining certain necessary physical conditions in the soil, under which this plant food can be used by the crop. A bulletin has just gone to press giving the details of the investigation, and discussing the influence of climate texture of soil, rotation, fertilizers, and soil management upon the yield of crops. The work is based upon analyses by new and exceedingly sensitive methods, by which the amount of plant food in the soil moisture itself, which is the great nutritive solution for the support of crops, has been determined, and not by digesting the soils in acids which attack the inert mineral matter of the soils.

While the conclusions appear to be in conflict with the opinions held for so many years by agricultural chemists, they are in strict conformity with the experience of good farmers in all countries, and with actual facts which have long been established by agricultural chemists. The fertility of the soil is thus shown to be due to physical causes which control the supply of water and plant food which it contains, as the soil moisture in all cases appears to be about the same in composition and concentration. The fertility is therefore controlled by a physical cause, and a chem-

ical examination of a soil cannot be expected to indicate the yield of a crop. It is believed that a simple physical method will be devised for determining the relative fertility of soils.—*Bulletin, U. S. Department of Agriculture.*

College and Alumni News.

Plans for the new Physics Building have finally been accepted by the Governor and Board of Trustees. The building is to cost \$80,000 and is to be located in the southeastern part of the campus between the library and biological buildings.

The annual reception given by the Townshend Literary Society to the students of the Agriculture and Domestic Science Departments at Townshend Hall, Friday evening, October 16, was a decided success. Several members of the agricultural faculty and their wives were present.

Professor Homer C. Price, the new Dean of the Agricultural College, made the opening address, followed by an interesting talk from Professor William R. Lazenby. Ices were served by members of the society, and the evening was most pleasantly spent in becoming acquainted.

Rivalry between the sophomore and the incoming freshman class of the University, which has always been more or less intense at the beginning of the school year, has found expression in a set of rules prohibiting the freshmen to wear caps or derbys on the campus, to smoke pipes on the campus, or loaf about the steps of University Hall. In case the freshmen do not obey the rules to the letter, their hats and caps are promptly confiscated by the upper classmen. In some cases hair clipping has

resulted when the freshmen grew rebellious and refuse to obey. Such class spirit marks an epoch in the history of the university and is an evidence that it is to attain to the position of the older eastern universities with their traditions.

The enrollment of students at the University has already reached 1800 this term, and is expected to exceed 2000 before the end of this college year. This year shows a greater increase in the attendance than ever before, as the entire enrollment last year was only 1712. The enrollment in the College of Agriculture is now 207, an increase over the same time last year of about 20.

Mr. C. C. Poindexter, 1903, who is now at Cornell, writes that he is well pleased, both with his work and with the university at large.

Merritt Harper, 1901, has been elected Assistant in Agriculture at the University of Missouri, vice E. L. Shaw, resigned.

J. S. Church, formerly a student of this college, is now located at Hibbing, Minn. Mr. Church was in Oregon and Washington for some time last year.

The College of Agriculture has entered two Shropshire and two Cotswold sheep, together with five Yorkshire barrows at the Chicago International Exposition. This is the first time that the University has been represented at this immense exposition, and the instance indicates the development which is taking place in animal husbandry. Professor Plumb expects to take a class to Chicago as usual this year. These excursions have been found to be very profitable to the students.

General Agricultural News.

The legislature of Hawaii has appropriated for the biennial period ending June 30, 1905, \$111,650 for the board of agriculture, horticulture and forestry.

The Missouri Station has established a laboratory for animal breeding, in which it is intended to investigate some of the applications of Mendel's law to the breeding of animals. This laboratory is said to be the first of its kind in the United States.

The summer school for teachers at the North Carolina A. & M. College which was initiated the past season held a very successful session. About 350 teachers were present, 140 of whom took agriculture and nature study.

Professor F. R. Marshall, formerly Assistant Professor of Animal Husbandry at the Iowa Agricultural College, has accepted the position of Professor of Animal Husbandry at the Texas A. & M. College.

The Iowa State College at Ames has annually an excursion day on which the people of the state are invited to visit the college. This day was celebrated on September 25, when over 15,000 people were present.

Dr. G. S. Fraps, Assistant Professor of Chemistry at the North Carolina A. & M. College, and Assistant Chemist to the Experiment Station, has been appointed Assistant Chemist at the Texas Experiment Station.

Clarence B. Lane, Assistant in Dairy Husbandry at the New Jersey Station, has been appointed Assistant Chief of the Dairy Division of the U. S. Depart-

ment of Agriculture to fill the place left by the resignation of Harry Haywood, who takes charge of the newly-organized agricultural department at Mount Herman School, Northfield, Mass.

There will be a civil service examination on November 11 to fill the position of Assistant in Soil Management, Bureau of Soils, U. S. Department of Agriculture.

Mr. Frank G. Miller of the University of Iowa has been appointed to the new Professorship of Forestry at the University of Nebraska.

Dean Davenport of the Illinois College reports an enrollment of 265 students in the first two days of the fall term, an increase of over 50 at the same time last year. More than 300 students are expected before the end of the term, the large number being due to the improvement made in the college during the last year. The students come better prepared this year and more intend to take the four-year course, showing that there is a greater interest manifested by the farmers of Illinois in the agriculture college.

A department of soil physics has been lately added to the Iowa State Agriculture College at Ames under Professor Stephenson. Professor Stephenson comes to the head of this department with a wide experience in this sort of work.

John L. Sheldon, of the Botanical Department of the University of Nebraska, has been appointed professor of bacteriology at the West Virginia Agricultural College.

